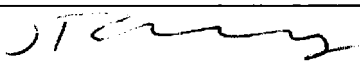



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<h1 style="text-align: center;">TRANSMITTAL FORM</h1> <p style="text-align: center;"><i>(to be used for all correspondence after initial filing)</i></p>		Application Number	10/725257-Conf. #1959
		Filing Date	December 2, 2003
		First Named Inventor	Ming Jey Yang
		Art Unit	2822
		Examiner Name	T. M. Thomas
Total Number of Pages in This Submission	3	Attorney Docket Number	95937-US1

ENCLOSURES (Check all that apply)		
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<div style="border: 1px solid black; padding: 5px; min-height: 40px;">         Remarks       </div>		

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT			
Firm Name	US NAVAL RESEARCH LABORATORY		
Signature			
Printed name	Joseph T. Grunkemeyer		
Date	July 6, 2006	Reg. No.	46,746

I hereby certify that this paper (along with any paper referred to as being attached or enclosed) is being transmitted electronically to the Patent and Trademark Office on the date shown below.	
Dated: <u>7/6/06</u>	Signature: <u></u> (Joseph T. Grunkemeyer)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In the application of: Yang et al.

Serial No.: 10/725,257

Filed: 12/02/2003

For: NANOFABRICATION OF InAs/AlSb HETEROSTRUCTURES

Examiner: Thomas, Toniae M.

Art Group Unit: 2822

Honorable Commissioner of Patents

PO Box 1450

Alexandria, VA 22313-1450

July 6, 2006

RESPONSE TO NON-FINAL REJECTION

Sir:

In response to the Office action of 04/10/2006, setting a three month shortened statutory period of reply, please consider the following remarks.

Claims 1-14, 17, and 18 are pending in the application. Claims 11-14, 17, and 18 are withdrawn pursuant to a restriction requirement. No claims are presently allowed. Claims 2, 3, and 5-10 have been objected to, but would be allowable in independent form.

Claim Rejections – 35 U.S.C. § 103

Claims 1 and 4 have been rejected under 35 U.S.C § 103(a) as being allegedly unpatentable over Tehrani et al. (US 5,349,214).

Claim 1 recites a method of fabricating a heterostructure device by building various layers, including a p-doped cap layer.

Tehrani discloses a heterojunction device including various layers.

In order to make a *prima facie* case of obviousness, each claim limitation must be disclosed in the references (MPEP 2143.03). Among other deficiencies, the reference does not disclose the limitation in claim 1 of forming a p-doped cap layer.

The Examiner stated that the p-doped cap layer is anticipated by the first cap layer 33 and second cap layer 34 of Tehrani. However, these layers are not disclosed as being p-doped. The only materials disclosed are GaSb for the first cap layer 33 and InAs for the second cap layer 34 (col. 7, lines 53-56). These materials alone are not p-doped. Although the reference refers to

GaSb as being p-type (col. 6, lines 43-46 (layer 27 is p-type) and col. 7, lines 49-50 (layer 27 is GaSb)), p-type is not the same as p-doped.

The Examiner further stated that “the cap structure 30, which includes cap layer 34, is selected so that the cap layer 34, overlying the quantum well layer 43 pins the Fermi level in the quantum well (col. 6, lines 53-59). Furthermore, the carriers in the quantum well layer 29 can be either electrons or holes, i.e. the quantum well layer can be either n-type or p-type (col. 6, lines 40-48). Therefore, depending on the type of carriers in the quantum well layer 29, a p-doped cap layer is required to pin the Fermi level in the quantum well layer 29.” (Office action of 04/10/2006, page 3, line 20-page 4, line 4.)

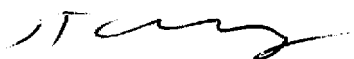
However, this is incorrect because the carriers in the quantum well layer 29 can only be electrons. Holes can only exist in this structure in quantum well layer 27. In Tehrani, cap structure 30 includes a barrier layer 32, a first cap layer 33, and a second cap layer 34 (col. 6, lines 1-5). If any part of cap structure 30 is p-doped, it will result in hole carriers in cap layer 33, which is not desirable. Although Tehrani claims “n-type and p-type materials could be reversed, if desired” (col. 6, lines 48-49), the cap structure would need to be redesigned in order to achieve the desired functionality if layers 29 and 27 are reversed. Merely p-doping any part of the cap structure 30 won’t work. In other words, p-doping is inherently prohibited.

Claim 4 depends from and contains all the limitations of claim 1. The arguments regarding the lack of *prima facie* for claim 1 are applicable to claim 4.

In view of the foregoing, it is submitted that the application is now in condition for allowance.

In the event that a fee is required, please charge the fee to Deposit Account No. 50-0281, and in the event that there is a credit due, please credit Deposit Account No. 50-0281.

Respectfully submitted,



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